

Claims

[c1] What is claimed is:

1. A model based controller system for controlling at least one neural network, comprising:
a plurality of models, wherein said plurality includes at least one modeled component, at least one recipe model, and at least one optimizer model, and wherein each of said at least one modeled components is corresponded to each of the at least one devices for control and is communicatively connected to at least one of said at least one recipe models, and wherein each of said at least one optimizer models monitors at least one of said at least one recipes and at least one of said at least one modeled components;
an executor resident above said plurality that coordinates at least one of the modeled components with at least one of the recipes to provide for virtual control, and that monitors said at least one optimizer for neural input to modify the virtual control; and
at least one interface that communicatively connects the executor to each of the at least one devices for control.

[c2] 2. The system of claim 1, wherein said optimizer model

comprises a predictive coordinator of the at least one recipe models.

[c3] 3. The system of claim 3, wherein the predictive coordinator suggests new control outputs from the at least one recipe model in accordance with a prediction for optimization.

[c4] 4. The system of claim 1, wherein each of the at least one recipes control at least one power plant.

[c5] 5. The system of claim 4, wherein the at least one optimization model optimizes cogeneration of power based on current fuel charges from a local power company.

[c6] 6. The system of claim 5, wherein the optimization model optimizes based on at least one selected from the group consisting of time of day, current solar input, and persons receiving power from the at least one power plant.

[c7] 7. The system of claim 1, wherein the at least one optimization model learns improvements to optimization by monitoring performance of at least one of the devices for control when the virtual control is varied.

[c8] 8. The system of claim 1, wherein each of the at least one device for control and the neural inputs comprise

COM components.

- [c9] 9. The system of claim 1, wherein the optimization model optimizes based on one selected from the group consisting of present, prior, or projected performance of the at least one device for control.
- [c10] 10. The system of claim 1, wherein at least one of said optimizer models is corresponded to one of said modeled components.
- [c11] 11. The system of claim 10, wherein the corresponded ones of said optimizer models are controlled by a master one of said optimizer models.
- [c12] 12. The system of claim 1, wherein each of the at least one device for control comprises an I/O device component for receiving signals corresponded to the virtual control, a neural network component for receiving signals corresponded to the neural inputs, and an equipment component for taking action in accordance with the virtual control.
- [c13] 13. The system of claim 1, wherein said at least one recipe model includes a process logic for operation of at least a portion of the at least one neural network and a device logic for control of the at least one device for control.

- [c14] 14. The system of claim 13, wherein said at least one optimizer models includes a process logic optimizer for optimizing the process logic, and a device logic optimizer for optimizing the device logic.
- [c15] 15. The system of claim 14, wherein the process logic comprises at least one selected from the group consisting of timing, settings, speeds, adjustments, and temperatures.
- [c16] 16. The system of claim 1, wherein said interface communicates the virtual control to the at least one device for control via a plurality of tag points correspondent to aspects of the at least device for control.
- [c17] 17. The system of claim 1, wherein data individually correspondent to each of the at least one devices for control is collected and archived in said executor.
- [c18] 18. The system of claim 1, wherein data individually correspondent to each process correspondent to each of said at least one recipe models is collected and archived in said executor.
- [c19] 19. The system of claim 1, wherein said at least one recipe model comprises at least two recipe models, and wherein a first of the at least two recipe models super-

vises a second of the at least two recipe models, and wherein each of the first recipe model and the second recipe model are on different nodes.

[c20] 20. The system of claim 19, further comprising a remote viewer, wherein each of the different nodes is viewable on at least one of said at least one remote viewer.

[c21] 21. The system of claim 1, wherein said at least one optimizer model comprises at least two optimizer models, and wherein a first of the at least two optimizer models supervises a second of the at least two optimizer models, and wherein each of the first optimizer model and the second optimizer model are on different nodes.

[c22] 22. The system of claim 21, further comprising a remote viewer, wherein each of the different nodes is viewable on at least one of said at least one remote viewer.

[c23] 23. The system of claim 1, wherein said executor archives at least two selected from the group consisting of process data each of the devices for control, process logic for the virtual control, process variables for the virtual control, process parameters for the virtual control, and set points placed for the virtual control.

[c24] 24. The system of claim 1, wherein said at least one interface engages actual control of the at least one device

for control in accordance with the virtual control.